

**PROPOSAL  
SPECIFICATIONS  
AND  
CONTRACT AGREEMENT  
FOR  
DRILLING AND BLASTING ROCK  
SKYLINE DRIVE SEWER PROJECT**



**CITY OF MANCHESTER  
DEPARTMENT OF HIGHWAYS**

**2012**

**Bid No. FY12-500-87**

MANCHESTER HIGHWAY COMMISSION

Raymond Hebert	Chairman
Hal Sullivan	Vice-Chairman
Rick Rothwell	Clerk
Bill Skouteris	Commissioner
Philip Hebert	Commissioner

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Kevin A. Sheppard, P.E.	Public Works Director
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CITY OF MANCHESTER

New Hampshire

PROPOSAL

SPECIAL PROVISIONS

and

CONTRACT AGREEMENT

for

**DRILLING AND BLASTING ROCK  
SKYLINE DRIVE SEWER PROJECT**

**FY12-500-87**

Prepared by

CITY OF MANCHESTER, NEW HAMPSHIRE

DEPARTMENT OF HIGHWAYS

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City of Manchester

Department of Highways

228 Maple Street, 4<sup>th</sup> Floor

Manchester, New Hampshire

## **INVITATION FOR BIDS**

Sealed proposals will be received at the office of the Department of Highways of the City of Manchester, New Hampshire before or at **3:00 P.M.**, prevailing time on the **17th of May, 2012**, for the following described services.

### **DRILLING AND BLASTING ROCK SKYLINE DRIVE SEWER PROJECT FY12-500-87**

This contract consists of drilling and blasting rock for the City forces to construct sewer mains and sewer services on Skyline Drive, Bernice Avenue and Meadow Glen Drive. All rock will be removed from the proposed excavations and disposed of by City forces.

Certified Check/Bid Bond \$5,000.00

Plans and specifications may be seen at the following locations:

- City of Manchester, Department of Highways, 227 Maple St., Manchester, NH 03103
- Associated General Contractors of N. H., 48 Grandview Road, Bow, N.H. 03304
- Works in Progress, 20 Farrell Street, Suite 103, So. Burlington, VT 05403
- Construction Summary of N.H., 734 Chestnut Street, Manchester, N.H.

Proposals must be completed in both words and numerals on regular proposal forms, which shall be submitted in a sealed envelope marked: Proposal for **“DRILLING AND BLASTING ROCK -SKYLINE DRIVE SEWER PROJECT”**, addressed and delivered to the Department of Highways not later than the date and time mentioned above, at which time they will be publicly opened and read aloud.

Proposals must be accompanied by a Certified Check or Bid Bond in the amount listed above, payable to: "Department of Highways, City of Manchester, N.H.", as security for the execution of the contract.

A Performance and Payment Bond each in the amount of 100 percent of the contract price, will be required of the successful bidder.

The right is reserved to waive any informalities in or reject any or all proposals and to accept the bid that is deemed most favorable to the interest of the City of Manchester.

A \$5.00 non-refundable mailing fee will be charged for bid proposal mailed to any contractor. Checks should be mailed to Department of Highways, 228 Maple Street, 4<sup>th</sup> floor, Manchester, N.H. 03103.

Questions regarding this Invitation to Bid should be directed to Mr. David Winslow, at (603) 624-6444, ext. 341.

Department of Highways, City of Manchester, N.H.

By: MANCHESTER HIGHWAY COMMISSION  
Raymond Hebert, Chairman

Hal Sullivan, Vice-Chairman  
Rick Rothwell, Clerk,

Bill Skouteris, Commissioner  
Philip Hebert, Commissioner

Kevin A Sheppard, P.E.  
Public Works Director

# **STANDARD SPECIFICATIONS FOR ROAD, DRAIN & SEWER CONSTRUCTION**

These specifications are intended to relay to developers, contractors and other builders and trades, information concerning the Department of Highways' requirements relative to all construction under its jurisdiction in the City of Manchester, NH.

To facilitate this end, the Standard Specifications have been divided into three parts as follows:

## **PART I -- PUBLIC IMPROVEMENTS**

Part I of the Standard Specifications outlines the Department's requirements concerning public improvements included in site development and subdivision projects. These requirements shall also apply to off-site improvements conducted within streets, rights-of-way, easements or other public lands belonging to the City of Manchester, New Hampshire.

All work relative to the above shall be conducted according to Section V of this part and the Technical Specifications as outlined in Part III.

## **PART II -- CONTRACT GENERAL PROVISIONS**

Part II of the Standard Specifications outlines the Department's contractual requirements concerning work for road, drain and sewer projects along with other related work. These requirements shall apply to all such work contracted by the City of Manchester, Department of Highways and shall be considered a part of all proposals.

## **PART III -- TECHNICAL SPECIFICATIONS**

Part III of the Standard Specifications outlines the Department's detailed requirements concerning the control of material, rules of construction and basis of payment. Supplemental Specifications not yet considered standard and Special Provisions for explaining items of work unique to a specific project, will be included in the proposal forms prepared by the Department.

The sections included in this part along with any Supplemental Specifications and Special Provisions, shall be considered a part of all proposals.

## **BID SECURITY**

The undersigned agrees to comply with the requirements as to the conditions of employment, wage rates and hours of labor set forth in the Form of "Contract Agreement". The undersigned hereby agrees to complete all the work shown or specified under this contract and as shown on the contract drawings within **90** consecutive calendar days from the date specified in the Notice to Commence Work and he further agrees that the OWNER may retain from the moneys that are or which may become due an amount of two hundred dollars (\$200.00) plus engineering charges for each and every calendar day (Sunday and holidays excluded) of time consumed in completing the work beyond the time conditions stipulated above or any extension of time that is duly authorized and such amount so to be retained, is hereby agreed to be liquidated damages accruing to the OWNER incident to such delay.

The undersigned agrees that if he is selected as CONTRACTOR, he will within ten (10) days, (Saturdays, Sundays and legal holidays excluded) after presentation thereof by the "Awarding Authority", execute a contract in the form attached hereto and furnish a Performance Bond and also a labor and materials or Payment Bond, each of a surety company registered and licensed to do business in the State of New Hampshire and satisfactory to the OWNER and each in the sum of at least one hundred percent (100%) of the contract price, the premiums for which are to be paid by the CONTRACTOR and are included in the bid price.

The undersigned understands that the OWNER reserves the right to reject any and all bids and to waive any informalities in the bidding.

---

Contractor's Signature

---

Title

---

Date

Certificate of Acknowledgment of Contractor, if a Corporation

State of \_\_\_\_\_,

ss:

County \_\_\_\_\_,

On this \_\_\_\_\_ day of \_\_\_\_\_

20\_\_\_\_

before me personally came \_\_\_\_\_

to me known, who being duly sworn did say as follows:

that he resides at: \_\_\_\_\_

and is the \_\_\_\_\_

of \_\_\_\_\_

the corporation described herein and which executed the foregoing instrument; that he knows the corporate seal of said corporation; the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation and by the like order, he signed thereto his name and official designation.

\_\_\_\_\_  
Notary Public (seal)

My commission expires: \_\_\_\_\_



## QUALIFICATION STATEMENT

The undersigned submits to answers to the following questions to enable the City of Manchester to judge of his experience and ability in and facilities for the work proposed to be done.

1. The work if awarded to you will have the resident personal supervision of whom?  
State his or their special qualifications.

---

---

2. Describe equipment you propose to furnish.

(a) Your own: \_\_\_\_\_

---

---

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---

---

(b) Rented:

---

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3. How many years has your organization been in business as a Contractor under the name in which you propose to execute this contract?

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4. What project has your present organization completed of character similar to that proposed? Give the information indicated by the following tabulation:

Name and Address of  
Owner for Whom  
Work was Done:

---



---

Work Done:  
Contractor or  
Subcontractor:

---



---



---

Description of  
Work:

---



---



---

Approximate  
Amount of  
Contract:

---

Approximate  
Date Work  
Was Done:

---

5. Has your present organization ever failed to complete any work awarded to it? If so,

state when, where, and why.

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6. If requested by the Department of Highways of the City of Manchester, I agree to provide a financial statement in the form required by the New Hampshire Department of Transportation prepared from an audit by a Certified Public Accountant. The statement shall be as of a date not more than three months prior to the date of the Proposal.
7. Give below the name of one or more banks which have information that would enable them to advise regarding the financial ability of your company. Are they authorized to provide such information if requested?

<u>NAME OF BANK</u>	<u>ADDRESS</u>
---------------------	----------------

<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>
<hr/>	<hr/>

Signature of Bidders\*

---

By: 

---

Title: 

---

Date: 

---

Address or permanent place of business to which notices may  
be sent:

---

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\*Important: Execute acknowledgment  
of officer or agent who  
signs this document.

## PROPOSAL

The City of Manchester acting through its Department of Highways hereinafter called the "Awarding Authority", requests bids for the furnishing of all labor, equipment and materials required for **“DRILLING AND BLASTING ROCK - SKYLINE DRIVE SEWER PROJECT ( FY12-500-87)”** in accordance with the plans and specifications prepared by the City of Manchester, Department of Highways.

The undersigned as Bidder declares that the only person or parties interested in this proposal as principals are those named herein; that this Proposal is made without collusion with any other firm, that the undersigned has carefully examined the location of the proposed work, the proposed form of contract and the plans and specifications therein referred to, and the undersigned proposes and agrees if this Proposal is accepted, he will contract with the "Awarding Authority" to provide all the necessary labor, machinery, tools, apparatus and other means of construction to do all the work and furnish all the materials specified in the contract in the manner and time therein described and according to the requirements of the Engineer therein set forth and the undersigned will take full payment therefore, the following unit and total prices:

Total price of this Proposal (for comparison of bids) based on the estimated quantities is:

_____	\$ _____
Total Price In Words	Total Price In Figures

CONTRACTOR: \_\_\_\_\_

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

It is agreed that the total price presented above, is to be used solely for the comparison of bids to determine the apparent low bidder.

Addendums received: \_\_\_\_\_

## PROPOSAL

The undersigned agrees that this Bid shall be good and may not be withdrawn for a period of ninety (90) calendar days after the scheduled closing time for receiving bids.

This Proposal includes Addenda No.: \_\_\_\_\_

\_\_\_\_\_  
Contractor (Bidder) (seal)

By: \_\_\_\_\_  
(Signature and Title)

Address: \_\_\_\_\_

\_\_\_\_\_

Being a (corporation incorporated)  
(under the laws of the )  
(State of \_\_\_\_\_)  
(Partnership, )  
(Individual )

Composed of Officers, partners, or  
owner, as follows:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**CITY OF MANCHESTER**  
**Department of Highways**

**INFORMATION REPORT**

**PROJECT:** Drilling and Blasting Rock  
Skyline Drive Sewer Project

**BID NUMBER:** FY12-500-87

**DATE BIDS OPENED:** At 3:00 P.M., Thursday, May 17, 2012

**PROJECT TYPE:** This contract consists of drilling and blasting rock for the City forces to construct sewer mains and sewer services on Skyline Drive, Bernice Avenue and Meadow Glen Drive. All rock will be removed from the proposed excavations and disposed of by City forces.

**CONTRACT PERIOD:** The contract period for this project shall be 90 calendar days beginning at the date of execution of the contract.

**PROPOSAL GUARANTEE:** \$5,000.00

This proposal shall be filled in by the bidder in ink with the prices written in both words and numerals and the extensions shall be made by the bidder. Amount in words will govern.

Bid Item Number	Estimated Quantity	Unit	Description (Bid Price in Words)	Unit Price (Bid in Figures)	Total Price (Bid in Figures)
204.7	25	DAY	SEISMIC MONITORING _____dollars and _____cents per DAY		
204.71	25	DAY	GAS MONITORING _____dollars and _____cents per DAY		
204.8	1	LS	PRE-BLAST SURVEY _____dollars and _____cents per LS		
206.21	400	CY	BLASTING OF ROCK (EXCAVATION BY OTHERS) _____dollars and _____cents per CY		
692	1	LS	MOBILIZATION _____dollars and _____cents per LS		
TOTAL BASE BID (in Words)	_____ _____ _____ _____				



## BID BOND

### Drilling and Blasting of Rock – Skyline Drive Sewer Project FY12- 500-87

The undersigned as bidder, understands and agrees that the quantities of work as given for each item in this Proposal are only approximate and are assumed solely for the comparison of proposals. They are not guaranteed to be accurate statements or estimates of the quantities of work to be performed under this contract and any departures there from, will not be accepted as valid grounds for any claim or loss of profits. In case of variation between unit prices and total prices stated by the bidder, the unit prices will be considered to be his bid.

The undersigned further agrees to comply with the requirements as to conditions of employment, wage rates and hours of labor set forth in the form of Contract Agreement.

The undersigned agrees that if he is selected as CONTRACTOR, he will, within ten (10) days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in the form attached hereto and furnish a Performance bond and also a labor and materials or Payment Bond, each of a surety company registered and licensed to do business in the State of New Hampshire satisfactory to the "Awarding Authority" and each in the sum of at least one hundred percent (100%) of the contract price, the premiums for which are to be paid by the Contractor and are included in the various unit prices bid.

Accompanying this Proposal under separate cover is Five Thousand Dollars (\$5,000.00) in the form of a Bid Bond, Cashier's Check or Certified Check\* payable to the Department of Highways of the City of Manchester.

The undersigned understands that the OWNER reserves the right to reject any and all bids and to waive any informalities in the bidding.

\*Bidder will cross out words that do not apply.

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Contractor's Signature

Date

---

Title

# Drilling and Blasting of Rock – Skyline Drive Sewer Project FY10-500-87

## PROSECUTION OF THE WORK

### **Description of the Work**

This contract consists of drilling and blasting rock for the City forces to construct sewer mains and sewer services on Skyline Drive, Bernice Avenue and Meadow Glen Drive. All rock will be removed from the proposed excavations and disposed of by City forces.

### **Utilities**

There are utility installations in the project area belonging to, but not necessarily limited to, the following:

		Telephone
Comcast	751 E. Industrial Park Dr.	626-9900
National Grid	130 Elm Street	625-4000
Manchester Fire Department	100 Merrimack Street	669-2256
Manchester Water Works	281 Lincoln Street	624-6494
Fairpoint	1228 Elm Street	645-3279
Public Service of NH	1000 Elm Street	668-3252

### **Prosecution**

It is understood that the Contractor will match his work schedule with that of the Highway Department and other utility companies as applicable. The Contractor will be expected to mobilize with 48 hours notice.

Due to the limited funding for this work, the City reserves the right to delete any part of the work in order to keep expenditures within the limits of available funds.

It will be the responsibility of the Highway Department to perform all excavation work to remove blasted rock. The Highway Department will assist the Contractor in moving mats.

The Contractor will be required to predrill and blast prior to City forces beginning their excavation. Areas that cross utilities will be excavated by City forces prior to drilling and blasting.

The Contractor's attention is drawn to the fact that the Contractor will be back charged for the cost of City crew's downtime waiting for ledge to be reblasted.

It is understood that payment for item 692 – Mobilization shall be paid in a lump sum. It is further understood that the payment of this item will not exceed the original contract amount bid, regardless of the fact that the Contractor may have, for any reason, shut

down his work on the project or moved equipment away from the project and then back again. The Contractor may also be required to move back and forth between different locations within the project multiple times during the work day.

It is understood that the Contractor will be required to work in close cooperation with the Water Works, National Grid, Verizon, and all other utilities until the project is completed.

Permits required from the Highway Department shall be furnished without charge. All work to be performed shall be in compliance with the City of Manchester Ordinances or as specified on the permit itself. A permit is required by the Fire Department in order to blast.

It will be the responsibility of the Contractor to comply with the City of Manchester Blasting Regulations. A copy of the regulations that became effective January 1, 2009 is provided under the Special Provisions Section. It shall be the responsibility of the Contractor to obtain a blasting permit as outlined in the Blasting Regulations. No separate payment shall be made for the blasting permit fee.

The Contractor shall coordinate with the Highway Department the placement and need for any piping as required/needed in order to vent gases.

Any required Traffic Control will be provided by the Highway Department.

### **Public Convenience and Property Protection**

The Contractor shall be aware that he will be required to maintain access to all properties in the project area at all times.

The Contractor will be responsible for the proper and timely notification to local residents and businesses should any temporary interruption of their access or services be absolutely necessary.

### **Layout of Work**

It will be the responsibility of the Highway Department to provide the layout of the baseline.

### **Contract Documents**

In the event of a conflict of interpretation in the Contract Documents, the following is the general order of precedence:

1. Special Contract Requirements\*
2. Special Provisions
3. Supplemental General Conditions
4. General Conditions

5. Supplemental Specifications
6. Specifications
7. Drawings

\*Includes Prosecution of Work, Traffic Control plan and Special Attentions.

Contract Period: The contract period for this project shall be 90 calendar days, beginning at the date of execution of the contract.

## SPECIAL PROVISIONS

### Blasting Within City Limits

#### **Blasting Permit Requirements**

- A blasting permit shall be required for all blasting projects conducted within the City of Manchester.
- The permit shall be obtained from the Fire Prevention Bureau at least ten (10) business days prior to the start of a blasting project and be valid for only one (1) calendar year.
- The blasting contractor shall issue a check in the amount of \$100.00, made payable to the City of Manchester.
- A copy of the blasting permit, material safety data sheets for all of the blasting product and a blasting plan outlining the scope of work to be performed along with daily reports of the blasting project shall be kept on file with the blasting contractor and made available to the Manchester Fire Department upon request. **Blasting plans shall identify all structures within three hundred feet (300') of blast and if present shall include the following preventive measures.**
- Provisions shall be made to notify the owner / resident of each structure set forth in the above criteria of the blasting project and conduct internal site inspections.
- The blasting contractor's environmental consultant shall survey all of the structures and develop a plan that identifies all likely or open pathways for potential gas entry into the structures such as: utility entrances, sump pump holes, stone foundations, cracks in basement floors and or dirt floors, etc.
- The plan shall also identify the location of all under ground utilities, trenches and drains both active and abandoned in blast area.
- Trench blasting shall be limited to twenty feet (20') at one time.
- Trenches shall be excavated down to and into the bedrock immediately after each detonation to relieve potentially harmful toxic gases.
- A six (6) to eight (8) foot relief hole shall be excavated all the way to grade adjacent to blast allowing gases vent.
- A vent pipe using twelve (12) inch slotted pipe shall be installed within thirty (30) yards of blast area to monitor carbon monoxide levels and LELs. CO readings above 200ppm and any LEL shall require mechanical ventilation. Blasting shall be discontinued until CO levels drop below 200ppm and LELs are mitigated.
- **With CO readings at the vent pipes above 200ppm provisions shall be made to provide monitoring of the homes within 300' of the blasting site. All blasting shall immediately be terminated and the Manchester Fire Department shall be notified should carbon monoxide levels or explosive gas levels in monitored structure (s) rise above EPA standards (9ppm).**
- The blasting company shall notify the fire department 24 hrs. prior to the start of the blasting operation and 1 hr. prior to each blast.
- A copy of the blasting company's current liability insurance policy shall be kept on file with the Fire Prevention Bureau.

- A New Hampshire licensed blaster shall be on site controlling all blasting procedures while blasting product is out of the magazine.
- Calibrated seismographs shall be used to monitor vibration levels.

## **SUPPLEMENTAL SPECIFICATION**

**Delete:** Section 204 -- Drilling And Blasting Rock from the Standard Specifications

**Replace with:**

### **SECTION 204 -- DRILLING AND BLASTING ROCK**

#### **Description**

**1.1** This work shall consist of drilling and blasting rock for roadway and pipe construction.

#### **Classification of Materials**

**2.1** Where used in these specifications, rock shall be construed to mean all solid rock which cannot be removed without blasting.

#### **3.1 General**

The Blasting Contractor's attention is directed to the rock drilling regulations adopted by the N.H. Department of Health and Human Services, Division of Public Health Services under the authority of the provisions of RSA 147:2 (Supp.).

The storage, handling, transportation and use of explosives shall conform with all Federal, State and local laws and regulations, including the rules and regulations of the Director of State Police and the provisions below.

The Blasting Contractor's attention is called to RSA 158:9-a (Supp.) which in part, provides that licenses must be obtained from the Director of State Police in order (1) to use, purchase, or transport explosives, or (2) to store explosives.

When the use of explosives is necessary for the prosecution of the work, the Blasting Contractor shall exercise the utmost care not to endanger life or property, including new work. The Blasting Contractor will be responsible for all damage resulting from the use of explosives.

All explosives shall be stored in a secure manner. All storage places shall be clearly marked. Explosives shall be stored in a magazine which shall be located in respect to buildings, railways, and highways in a manner as required by the Director of State Police.

The Blasting Contractor shall notify each property owner and public utility company having structures in proximity to the site of the work of his intention to use explosives. Such notice shall be given sufficiently in advance to enable the parties to take such steps as they may deem necessary to protect their property from injury.

Explosives shall be used only during daylight hours, shall be handled only by competent workmen, and particular care shall be taken to insure that no unexploded charges remain in the work.

All persons within the danger zone of blasting operations shall be warned and no blasting shall be done until the zone has been cleared. Sufficient flaggers shall be stationed outside the danger zone to stop all approaching traffic during blasting operations.

#### **4.1 Blasting Operations**

**4.1.1** The Engineer shall, at all times, have the authority to prohibit or halt the Contractor's blasting operations if it is apparent that through the methods being employed, that the safety and convenience of the public is being jeopardized.

**4.1.2** All blasting operations, including the storage and handling of explosives and blasting agents, shall be performed in accordance with the applicable provisions of the Standard Specifications and all other pertinent Federal, State, and local regulations. Whenever explosives are used, they shall be of such character and in such amount as is permitted by the State and local laws and ordinances and all respective agencies having jurisdiction over them.

**4.1.3** The Contractor shall observe the entire blast area to guard against potential hazards before commencing work. The Contractor shall not be allowed to store explosives on the project site or on City owned property unless prior approval is granted by the Department.

**4.1.4** Drill hole conditions may vary from dry to filled with water. The Contractor will be required to use whatever type(s) of explosives and/or blasting accessories necessary to accomplish the specified results.

#### **4.2 Blasting Log**

**4.2.1** A blasting log must be completed daily for every primary blast and copies must be provided to the Engineer. An example of a typical blasting log is shown in Figure 204-1. The drilling contractor may use a different format for his blasting log if it has been approved by the Engineer.

#### **4.3 Blast vibration control and monitoring.**

**4.3.1** The Contractor shall be required to comply with the blasting vibration limits established herein. The Contractor shall provide for monitoring of the blasting vibrations (both ground and air concussions) produced as a result of the construction activities and shall provide for a pre-blast condition survey of structures. The Contractor shall cooperate in adjusting his blasting procedures to maintain the vibration limits specified herein and to minimize vibration-related claims and complaints.



#### **4.3.1.1 Vibration limits.**

**4.3.1.1.1** Ground Limits. The maximum peak particle velocity of ground vibration (in any of the three mutually perpendicular components of particle velocity) for above-ground, residential structures shall not exceed the following limits:

<i>Ground Vibration</i>		
<i>Peak Particle Velocity Inches/Sec</i>		
<i>Type of Structure</i>	<i>Frequencies</i>	<i>Frequencies</i>
	<i>Below 40 HZ</i>	<i>40 HZ or Greater</i>
<i>Modern Homes</i>		
<i>-Drywall Interiors</i>	<i>0.75</i>	<i>2.0</i>
<i>Older Homes</i>		
<i>-Plaster on Wood</i>		
<i>Lath for Interiors</i>	<i>0.50</i>	<i>2.0</i>

**4.3.1.1.2** The maximum peak particle velocity of ground vibrations (in any of the three mutually perpendicular components of particle velocity) for non-residential structures shall not exceed 2.0 inches/sec.

**4.3.1.1.3** The maximum peak particle velocity of ground vibrations (in any of the three mutually perpendicular components of particle velocity) for underground utilities shall not exceed 2.0 inches/sec. Buried pipelines and other utilities owned by private utility companies are sometimes subject to lower limiting values imposed by the owner.

**4.3.1.1.4** Deteriorated structures or utilities, structures housing computers or other sensitive equipment, and manufacturing processes that are sensitive to vibrations may require lower peak particle velocity limits than stated in this specification.

**4.3.1.1.5** Air concussion. The contractor shall conduct all blasting activities in such a manner that the peak airblast overpressure at all above ground, occupied structures in the vicinity of blasting does not exceed 128 decibels (dB).

**4.3.1.1.6** If blast induced ground vibrations exceed the limits for maximum peak particle velocity, then alternative rock excavation techniques may be necessary. All non-explosive methods of rock excavation are subject to approval by the Engineer.

*BLASTING LOG*

*FIGURE #204-1*

1. *Company name:* \_\_\_\_\_

2. *Location of Shot (Station):* \_\_\_\_\_

3. *Shot #:* \_\_\_\_\_ 4. *Time:* \_\_\_\_\_ 5. *Date:* \_\_\_\_\_

6. *Weather:* \_\_\_\_\_

7. *Wind Direction:* \_\_\_\_\_ 8. *Temperature:* \_\_\_\_\_

9. *Distance & Direction to Nearest Structure:* \_\_\_\_\_ & \_\_\_\_\_

10. *Depth of Water (ft.):* \_\_\_\_\_

11. *Total Explosives Allowed Per Delay Period:*

2

*[Distance in Feet]*

*Weight of Explosive(s) =* ----- *=* \_\_\_\_\_  
2500

12. *Diameter of Holes (in.): Production* \_\_\_\_\_ *Presplit* \_\_\_\_\_

13. *Hole Depth (ft.):* \_\_\_\_\_

14. *Total # of Holes:* \_\_\_\_\_

15. *Drill Pattern - Burden x Spacing (ft.):* \_\_\_\_\_

16. *Type and Height of Stemming (ft.):* \_\_\_\_\_

17. *Depth of Sub-Drilling (ft.):* \_\_\_\_\_

18. *Mats or Other Protection Used:* \_\_\_\_\_

19. *Types of Explosive(s) Used: Presplit* \_\_\_\_\_

*Production:* \_\_\_\_\_

20. *Density of Explosive(s) Used:* \_\_\_\_\_

21. *Kind of Delay Periods:* \_\_\_\_\_

22. *Total # of Delay Periods:* \_\_\_\_\_

23. *Length of Delay Periods (ms):* \_\_\_\_\_

24. Total of Explosives Used (lbs.): \_\_\_\_\_

25. Maximum # of Holes Per Delay Period: \_\_\_\_\_

26. Maximum Amount of Explosive(s) Per Delay Period (lbs): \_\_\_\_\_

27. Powder Factor = 
$$\frac{\text{Pounds of Explosives Per Hole}}{\text{Cubic Yards of Rock Per Hole}}$$

Powder Factor = \_\_\_\_\_

28. Scale Distance = 
$$\frac{\text{Distance in Feet}}{0.5}$$
  
(Weight Per Delay Period)

Scale Distance = \_\_\_\_\_

29. Method of Firing: \_\_\_\_\_

30. # Series, Circuits: \_\_\_\_\_

31. Location of Seismograph: \_\_\_\_\_

a. Distance from Shot and Direction:

b. Person Taking Reading:

c. Seismograph Reading:

d. Peak Sound Pressure Level:

e. Vibration Measurements:

Transverse

Vertical

Longitudinal

DIAGRAM OF SHOT

. . . . .

. . . . .  
. . . . .  
. . . . .  
. . . . .  
. . . . .  
. . . . .  
. . . . .  
. . . . .

*Name of Blaster:*\_\_\_\_\_

*License Number of Blaster:*\_\_\_\_\_

**4.3.1.2** Pre-blast condition survey. Blasting Contractor shall conduct a pre-blast condition survey of all existing structures and conditions on the site, adjacent to the site, or in the vicinity of the site. This survey shall extend to such structures (including swimming pools and mobile homes) or conditions as may be affected by the Blasting Contractors operations.

**4.3.1.2.1** The pre-blast condition survey shall consist of a written description of the interior and exterior condition of each of the structures examined. Descriptions shall locate any existing cracks, damage, or other defects and shall include such information so as to make it possible to determine the effect, if any, of the construction operations on the defect. Where significant cracks or damage exists, or for defects too complicated to describe in words, photographs shall be taken. A good quality videotape survey with appropriate audio description of locations, conditions, and defects can be used. Prior to the start of work, a copy of the pre-blast condition survey shall be submitted to the Engineer for review.

**4.3.1.2.2** The person conducting the pre-blast condition survey shall give written notice to the owner of the property concerned, tenants of the property, and any representative of local authorities required to be present at such survey. The notice shall state the dates on which surveys are to be made. Copies of all notices shall be provided to the Engineer.

**4.3.1.2.3** Prior to the start of blasting activities, the Contractor shall place an advertisement in the local newspaper identifying the project, Blasting Contractor, site location, warning signals and precautions being taken by the Blasting Contractor to minimize disturbance to residents.

**4.3.1.2.4** Upon completion of the blasting work, the Contractor shall conduct a post-blast survey of any properties, structures, and conditions where complaints of damage have been received or damage claims have been filed. Notice shall be given to all interested parties so that they may be present during the final examination. Records of the final examination shall be distributed the same as the original pre-blast condition survey.

**4.3.1.3** Vibration monitoring instrumentation. All vibration monitoring instrumentation proposed for use on the project by the Contractor shall comply with the following characteristics:

- a) Measure, display, and provide a permanent record on a strip chart of particle velocity components.
- b) Measure the three (3) mutually perpendicular components of particle velocity in directions vertical, radial and perpendicular to the vibration source.
- c) Have a velocity frequency response of 2 Hz to 150 Hz, and be capable of measuring peak particle velocity of up to 10 inches per second.

d) All seismographs used on the project shall display the date of the most recent calibration.

e) Calibration must have been performed within the last 12 months and must be performed to a standard traceable to the National Bureau of Standards.

**4.3.1.4** Carbon monoxide gas (CO) and explosive gas levels (LEL's) shall be monitored per the City of Manchester blasting permit requirements.

**4.3.1.4 Report of Monitoring Results.**

**4.3.1.4.1** Following each blast, the Contractor shall immediately report the measured vibrations to the Engineer. In the event seismic vibrations caused by the Contractor's operations approach the established limits for this project, the Engineer may require the Contractor to modify his blasting operations to reduce the vibrations. If the seismic ground vibration and/or air concussions caused by the Contractor's blasting operation attain or surpass the established limits, the operations shall cease. Blasting shall not be resumed until measures have been taken to reduce, to the satisfaction of the Engineer, the produced vibrations and/or air concussions below established limits.

**4.3.1.4.2** Within 24 hours following each blast, the Contractor shall submit to the Engineer in writing the following items:

a) Details of the round as shot to include the information shown on the sample blasting log (see Figure 204-1)

b) Results of blast monitoring at each instrument location, including peak particle velocity in inches per second (in/sec), as well as a copy of the strip chart recording for each monitoring location, marked with the date, time, location of the equipment, and signature of seismograph operator.

**4.3.1.4.3** If CO gas exceeds 200ppm or the LEV rise above EPA standards of 9ppm then the Manchester Fire Department shall be notified and monitoring of these gases shall be provided within the homes within 300' of the blasting site. All blasting shall immediately be terminated.

**4.3.1.5** Preblast meeting. A preblast meeting shall be held prior to the start of any drilling or blasting activities. The purpose of the meeting shall be to review the blasting procedures and vibration monitoring requirements, and to facilitate coordination between all parties involved. Individuals attending the preblast meeting should include the Project Engineer, the Blasting Contractor, the Contractor's Seismologist/Blasting Consultant, the Research Geologist and any other personnel the Engineer deems appropriate.

**4.3.1.6** Blasting schedule. The Contractor shall notify the Engineer of blast round schedules in accordance with the following requirements:

a) At least 24 hours in advance, notification of estimated time of blast.

b) At 30 minutes prior to a blast give a stand-by notification.

**4.3.1.7** Warning signals. Adequate warnings shall be given to all personnel in proximity to the blast site at least 3 minutes in advance of each blast. The Contractor shall use sirens and/or horns with sufficient intensity such that they can be heard for a minimum distance of 1,000 ft.

**4.3.1.8** Flyrock control. Before the firing of any blast in areas where flying rock or debris may result in personal injury or damage to property, the rock to be blasted shall be covered with approved blasting mats, soil, or other equally serviceable material, to prevent flyrock. The method of flyrock control shall be subject to approval by the Engineer.

**4.3.1.9** Responsibility for blasting operations. Review of the Contractor's blasting submittals by the Department or its Engineer shall not relieve the Contractor of his responsibility for the accuracy, adequacy, and safety of the blasting; exercising proper supervision and field judgement; preventing damage to structures; and producing results within the limits required by the State of New Hampshire regulations, The City of Manchester Blasting Regulations and these Specifications. The Blasting Contractor shall be solely and completely responsible for the safety of all persons and property during the performance of his work. The Contractor shall take whatever measures he deems necessary, in addition to the requirements herein, to protect the safety of persons and property, both at the construction site and away from the site. The Contractor shall have full and complete responsibility for handling, discharging or settling of any and all damage or annoyance claims resulting from the blasting activities on the project. Any monitoring and/or review of the Contractor's procedures and performance conducted by the Department or its Engineer shall not relieve the Contractor of his responsibility for safety at and away from the site, and for preventing damage to adjacent structures or property.

**4.4** All drilling and blasting work performed by the Contractor shall produce slopes or configurations in reasonably close conformity with the lines, grades, cross- sections and dimensions shown on the plans.

**4.5** All rock shall be removed from the proposed excavations by City forces in accordance with the Blasting Contractor's blasting schedule. The rock shall be sufficiently broken so that it may be conveniently handled by equipment at the disposal of the City.

### **Method of Measurement & Basis of Payment**

**5.1** Drilling operations shall be measured by the number of hours of actual drilling time. The hourly rate shall include the cost for use of a track drill, compressor and operator.

- 5.2** Jackhammer operations shall be measured by the number of hours of actual jackhammering time. The hourly rate shall include the cost for use of a jackhammer, compressor and operator.
- 5.3** The Blaster shall be compensated at an hourly rate for the actual time performing blasting operations.
- 5.4** Powder shall be paid for by the pound for the actual number of pounds used to accomplish the work.
- 5.5** Blasting Caps shall be paid for per each for the actual number used to accomplish the work.
- 5.6** Blasting Mats shall be paid for by the day for the number of days they are used.
- 5.7** Seismic monitoring shall be paid for by the day for the number of days of actual monitoring.
- 5.8** Gas monitoring shall be paid for by the day for the number of days of actual monitoring.
- 5.9** Pre-blast Condition Surveys will be paid for at actual cost for each job site. Compensation for pre-blast surveys will be paid only upon submitted of "paid" invoices. No markups above the invoice will be allowed.
- 5.10** Detonation wire (aka leading line, blasting wire, trunk line) shall be paid for by the linear foot for the actual length of line used to carry the electric charge to detonate explosives and accomplish the work.

**Pay Items and Units:**

204.1	Drilling	Hour
204.2	Jackhammer w/Operator	Hour
204.3	Blaster	Hour
204.4	Powder	Pound
204.5	Blasting Caps	Each
204.55	Detonation wire	Linear Foot
204.6	Blasting Mats	Day
204.7	Seismic Monitoring	Day
204.71	Gas Monitoring	Day
204.8	Pre-blast Survey	Allowance



## **SUPPLEMENTAL SPECIFICATION**

### **Section 206 – Structure Excavation for Pipes and other Minor Structures**

#### **Delete:**

##### **Basis of Payment**

**5.8** No separate payment will be made for pre-blast and post blast surveys or blasting monitoring work.

#### **Add:**

##### **Basis of Payment**

**5.8** If excavation is to be performed by others, operations required to blast and fracture the rock in order for it to be ready for excavation shall be paid for by the cubic yard of ledge blasted. Payment limits will be based upon those established within this section.

#### **Pay items and units:**

206.21	Blasting of Rock (Excavation by Others)	C.Y.
--------	---	------

## **SUPPLEMENTAL SPECIFICATION**

### **Section 692 – Mobilization**

#### **Delete:**

##### **Basis of Payment**

**4.1** This item will be measured as a Unit

Pay item and unit:

692	Mobilization	Unit
-----	--------------	------

#### **Add:**

##### **Basis of Payment**

**4.1** This item will be measured as a Lump Sum

Pay item and unit:

692	Mobilization	Lump Sum
-----	--------------	----------

## CONTRACT AGREEMENT

THIS AGREEMENT made this \_\_\_\_<sup>th</sup> day of \_\_\_\_\_ A.D. 2012 by and between the City of Manchester, New Hampshire acting through its Department of Highways, hereinafter called the party of the first part and

\_\_\_\_\_ their successors and assigns, party of the second part, hereinafter called the Contractor. Witnesseth, that the Contractor, for and in consideration of the payment or payments herein specified and agreed to by the party of the first part, hereby covenants and agrees to furnish and deliver all the materials and to do and perform all the work and labor in the construction of the **Drilling and Blasting of Rock – Skyline Drive Sewer Project** hereinafter called the project, in the City of Manchester, County of Hillsborough, State of New Hampshire at the unit prices bid by the said Contractor for the respective estimated quantities, aggregating approximately the sum of: \_\_\_\_\_ **Dollars and** \_\_\_\_\_ **Cents (\$** \_\_\_\_\_ **)** and such other items as are mentioned in the original proposal, which proposal and prices named, together with the General Provisions and Technical Specifications and the Special Provisions accompanying the proposal, and made a part of this Contract and accepted as such, are also agreed by each party as being a part hereof, the said project being a

Repair of a 30 foot deep, 48 inch RCP storm drain. Included is the removal and replacement of existing buried drain manhole and extension of the new manhole to the existing ground surface.

The Contractor further covenants and agrees that all of the said materials shall be furnished and delivered and all of said labor shall be done and performed in every respect to the satisfaction and approval of the Department of Highways aforesaid, within **90 consecutive calendar days** from the date specified in the Notice to Proceed.

The successful Bidder at the time of the execution of the Contract, must deposit with the Department of Highways security in the form of a Performance Bond and a Payment Bond, each in the sum equal to 100 percent of the amount of the contract award. The form of the bonds shall be that provided by the Department and the surety shall be acceptable to the City.

IN WITNESS WHEREOF, the parties of this contract have hereunto set their hands and seals as of the day and year first above written.

CITY OF MANCHESTER  
(SEAL)

The Honorable Mayor of the  
CITY OF MANCHESTER

By \_\_\_\_\_  
Theodore L. Gatsas

DEPARTMENT OF HIGHWAYS

By \_\_\_\_\_  
Kevin A Sheppard, P.E.  
Director of Public Works

Signed and sealed in  
presence of:

\_\_\_\_\_

\_\_\_\_\_  
Date

CONTRACTOR  
(SEAL)

\_\_\_\_\_  
By:  
Title:  
Federal I.D. No.

Approved as to form and execution

\_\_\_\_\_  
City Solicitor

NOTARIZATION

Certificate of Acknowledgment of Contractor, if a Corporation

State of New Hampshire,

ss:

County of Hillsborough,

On this \_\_\_th day of July 2012

before me personally came \_\_\_\_\_

to me known, who being duly sworn did say as follows:

that he resides at: \_\_\_\_\_

and is the \_\_\_\_\_ of \_\_\_\_\_ the  
corporation

described herein and which executed the foregoing instrument; that he knows the  
corporate seal of said corporation; the seal affixed to the foregoing instrument is such  
corporate seal and it was so affixed by order of the Board of Directors of said  
corporation and by the like order, he signed thereto his name and official designation.

\_\_\_\_\_  
Notary Public (seal)

My commission expires:\_\_\_\_\_

## STATEMENT OF UNDERSTANDING

### Project Safety

WHEREAS this project is subject to all Safety and Health Regulations as promulgated by the U.S. Department of labor, it shall be a requirement that the Contractor designate a "Safety Officer" who's duty shall be to monitor the project on a daily basis in order to insure that all safety measures alluded to in the contract and otherwise pertinent to this project, are strictly adhered to. Special attention shall be paid to maintaining existing guide, regulatory and warning signs affecting the movement of traffic.

IT IS hereby agreed that responsibility for the above mentioned safety measures is solely that of the Contractor and that \_\_\_\_\_ has been designated as the project "Safety Officer".

Date:

By: \_\_\_\_\_

Title:

**STATEMENT OF COMPLIANCE**  
**Drug Testing Program**

WHEREAS this project is subject to federal laws, rules and regulations, and WHEREAS all drivers of commercial vehicles over 26,000 pounds GVWR are required to have a Commercial Drivers License (CDL), it is hereby certified that the Alcohol and Drug Testing requirements for Commercial Motor Vehicle Drivers mandated by the Federal Highway Administration, United States Department of Transportation are being complied with.

Date:

By: \_\_\_\_\_

Title:

## PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we \_\_\_\_\_  
\_\_\_\_\_ a \_\_\_\_\_ hereinafter  
called the "Principal" and \_\_\_\_\_ of \_\_\_\_\_, State  
of \_\_\_\_\_ hereinafter called the "Surety", are held and firmly  
bound  
unto THE CITY OF MANCHESTER, NEW HAMPSHIRE, hereinafter called "Owner",  
in the penal sum of \_\_\_\_\_  
dollars (\$\_\_\_\_\_) in lawful money of the United States, for the payment of  
which sum well and truly to be made, we bind ourselves, our heirs, executors,  
administrators and successors, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION is such that WHEREAS, the Principal  
enter into a certain contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_  
copy of which is hereto attached and made a part of hereof for the construction of:

### **DRILLING AND BLASTING OF ROCK – SKYLINE DRIVE SEWER PROJECT, FY12- 500-87**

in accordance with drawings and specifications prepared by the City of Manchester, N.H.  
which contract is by reference made a part hereof, and is hereinafter referred to as the  
Contract.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties,  
all the undertakings, covenants, terms, conditions and agreements of said contract during  
the original term thereof, and any extensions thereof which may be granted by the  
Owner, with or without notice to the Surety, and if he shall satisfy all claims and  
demands incurred under such contract, and shall fully indemnify and save harmless the  
Owner from all costs and damages which it may suffer by reason of failure to do so, and  
shall fully reimburse and repay the Owner for all outlay and expense which Owner may  
incur in making good any default, then this obligation shall be void; otherwise to remain  
in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and  
agrees that no change, extension of time, alteration or addition to the terms of the  
contract or to the work to be performed thereunder, or the specifications accompanying  
the same, shall in any way affect its obligation on this bond, and it does hereby waive  
notice of any such change, extension of time, alteration or addition to the terms of the  
contract or to do the work or to the specifications.



PROVIDED FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed and original, this the \_\_\_\_ day of \_\_\_\_\_ 20\_\_.

ATTEST:

\_\_\_\_\_  
Principal

\_\_\_\_\_(S)  
(Principal)

\_\_\_\_\_  
(Seal) By \_\_\_\_\_(S)

\_\_\_\_\_(S)  
Witness as to Principal

\_\_\_\_\_  
Address

ATTEST:

\_\_\_\_\_  
Surety

\_\_\_\_\_(S)  
(SURETY) By \_\_\_\_\_(s)  
\_\_\_\_\_  
Attorney-in-Fact

(SEAL)  
\_\_\_\_\_(S)  
Witness to Surety

\_\_\_\_\_  
\_\_\_\_\_  
(Address)

\_\_\_\_\_  
Address

Note: Date of Bond must not be prior to date of Contract.

## PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That \_\_\_\_\_

\_\_\_\_\_ as Principal, hereinafter called, Principal, and  
\_\_\_\_\_ as surety, hereinafter called Surety, are held and firmly  
bound unto THE CITY OF MANCHESTER, NEW HAMPSHIRE, as obligee, hereinafter  
called Owner, for the use and benefit of claimants as herein below defined, in the amount  
of \$ \_\_\_\_\_ dollars  
(\$ \_\_\_\_\_) for the payment whereof Principal and Surety bind  
themselves, their heirs, executors, administrators, successors and assigns, jointly and  
severally, firmly by these presents.

WHEREAS, Principal has by written agreement, dated \_\_\_\_\_ entered into a contract  
with Owner for the construction of

### **DRILLING AND BLASTING OF ROCK – SKYLINE DRIVE SEWER PROJECT, FY12- 500-87**

in accordance with drawings and specifications prepared by the City of Manchester, N.H.  
which contract is by reference made a part hereof, and is hereinafter referred to as the  
Contract.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms,  
subcontractors, and corporations furnishing materials for or performing labor in the  
prosecution of the work, provided for in such contract, and any authorized extension or  
modification thereof, including all amounts due for materials, lubricants, oil, gasoline,  
coal and coke, repairs on machinery, equipment and tools consumed or used in  
connection with the construction of such work, and all insurance premiums on said work,  
and for all labor, performed in such work, whether by subcontractor or otherwise, then  
this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and  
agrees that no change, extension of time, alteration or addition to the terms of the  
contract or to the work to be performed thereunder, or the specifications accompanying  
the same shall in any way affect its obligation on this bond, and it does hereby waive  
notice of any such change, extension of time, alteration or addition to the terms of the  
contract or to do the work or the specifications.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor  
shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one  
of which shall be deemed and original,

this \_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

ATTEST:\_\_\_\_\_Principal

\_\_\_\_\_(Principal)

(Seal) By\_\_\_\_\_ (S)

\_\_\_\_\_

By:\_\_\_\_\_Witness as to Principal(s)

\_\_\_\_\_

\_\_\_\_\_Address

\_\_\_\_\_Surety

ATTEST: By\_\_\_\_\_Attorney-in-Fact(S)

\_\_\_\_\_(Surety)

(Seal)

By:\_\_\_\_\_ (S)

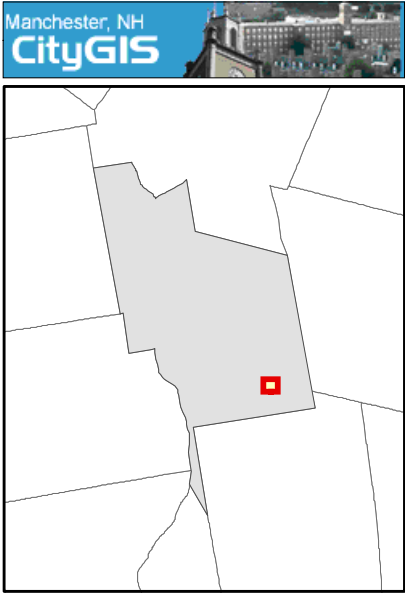
Witness as to Surety

\_\_\_\_\_

Note: Date of Bond must not be prior to date of Contract.

**Appendix A**  
**GIS Map of Project Area**





Area Map Showing Extent Of Map At Left

A more detailed map and lot information can be found on the City's Web GIS system at:  
<http://208.82.76.123/pubgis/>

- Legend
- Parcels
  - Sewer CSO/OC
  - Sewer Lamp Hole
  - Sewer Meter
  - Sewer Outfall
  - Sewer Plug
  - Sewer Pump Station
  - Sewer Manhole
  - Sewer Unknown
  - Sewer Wet Well
  - Sewer Force/Syphon
  - Sewer Pipe
  - Road Names
  - Road Centerlines

DISCLAIMER

The information appearing on this map is for the convenience of the user and is not an official public record of the City of Manchester, NH (the "City"). This map is not survey-quality. All boundaries, easements, areas, measurements, rights-of-way, etc. appearing on this map should only be considered approximations, and as such have no official or legal value. The City makes no warranties, expressed or implied, concerning the accuracy, completeness, reliability, or suitability of this information for any particular use. The City assumes no liability whatsoever associated with the use or misuse of this information. The official public records from which this information was compiled are kept in the offices of various City, County, and State government agencies and departments, and are available for inspection and copying during normal business hours. By using this map, you agree to these terms and conditions.



## **Appendix B**

### **Project Plans**

**DRAFT**

1. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PRIVATE DRIVES AT THE END OF EACH DAY.
2. THE CONTRACTOR SHALL USE FLOWABLE FILL FOR ALL CROSSINGS OF WATER LINES 6" DIA. OR LARGER.

- (A) CONTRACTOR TO VERIFY APPROXIMATE LOCATION OF EXISTING SEPTIC SYSTEM PIPE DETERMINED BY THE HOMEOWNER IN THE RETURNED QUESTIONNAIRE.
- (B) CONTRACTOR TO VERIFY HOME CONNECTED TO THE EXISTING SEWER SYSTEM DETERMINED BY THE HOMEOWNER IN THE RETURNED QUESTIONNAIRE.
- (C) THE CONTRACTOR SHALL CONFIRM THE HOUSE SEWER SERVICE LOCATION
- (D) THE CONTRACTOR SHALL CONFIRM THE HOME IS CONNECTED TO THE EXISTING SEWER.

CB 2841  
RIM ELEV.=228.8'  
INV. IN ELEV.=222.9' (18" HDPE)  
INV. IN ELEV.=222.8' (18" HDPE)  
INV. OUT ELEV.=222.8' (18" HDPE)

CB 2878  
RIM ELEV.=228.6'  
INV. IN ELEV.=223.6' (18" HDPE)  
INV. OUT ELEV.=223.3' (18" HDPE)

CB 2882  
RIM ELEV.=229.5'  
INV. IN ELEV.=225.1' (15" RCP)  
INV. IN ELEV.=224.9' (UNKNOWN)  
INV. OUT ELEV.=223.8' (18" HDPE)

CB 2896  
RIM ELEV.=232.9'  
INV. IN ELEV.=227.7' (15" RCP)  
INV. IN ELEV.=228.2' (15" RCP)  
INV. OUT ELEV.=227.4' (15" RCP)

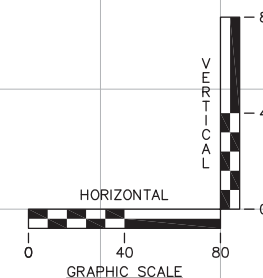
CB 2933  
RIM ELEV.=228.1'  
INV. OUT ELEV.=223.5' (18" HDPE)

CB 2933  
RIM ELEV.=228.1'  
INV. OUT ELEV.=223.5' (18" HDPE)



SCALES:  
HORIZONTAL 1" = 40'  
VERTICAL 1" = 4'

**REDUCED  
DO NOT SCALE**



150 Dow Street, Manchester, NH 03101-1227  
Tel (603) 669-5555 Fax (603) 669-4168 Web: [www.hoyletanner.com](http://www.hoyletanner.com)  
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City of Manchester, New Hampshire  
Cohas Brook Sewer Project - Contract No. 2

SKYLINE DRIVE  
PLAN AND PROFILE

STA 0+00 TO STA 4+72

DRAWING NO.

# CL-1

SHEET 59 OF 68

1. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL PRIVATE DRIVES AT THE END OF EACH DAY.
2. THE CONTRACTOR SHALL USE FLOWABLE FILL FOR ALL CROSSINGS OF WATER LINES 6" DIA. OR LARGER.

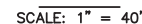
- (A) CONTRACTOR TO VERIFY APPROXIMATE LOCATION OF EXISTING SEPTIC SYSTEM PIPE DETERMINED BY THE HOMEOWNER IN THE RETURNED QUESTIONNAIRE.
- (B) CONTRACTOR TO VERIFY HOME CONNECTED TO THE EXISTING SEWER SYSTEM DETERMINED BY THE HOMEOWNER IN THE RETURNED QUESTIONNAIRE.
- (C) THE CONTRACTOR SHALL CONFIRM THE HOUSE SEWER SERVICE LOCATION
- (D) THE CONTRACTOR SHALL CONFIRM THE HOME IS CONNECTED TO THE EXISTING SEWER.

PROJECT NO.	111115
FILE NAME	111115CL-C02

City of Manchester, New Hampshire  
**Jonas Brook Sewer Project - Contract No. 2**  
**MEADOW GLENN DRIVE**  
**PLAN AND PROFILE**  
**STA 0+00 TO STA 5+23**

CL-2

CONTRACTOR TO  
CONFIRM SEWER  
SERVICE LOCATION



SCALES:  
HORIZONTAL 1" = 40'  
VERTICAL 1" = 4'



SCALES:  
HORIZONTAL 1" = 40'  
VERTICAL 1" = 4'

